

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for monitoring the health of a system, which comprises performing at each of a plurality of times the steps of:
 - constructing a condition signature for a present time from a plurality of condition indicators including (a) a plurality of vibration measurements acquired from said system or (b) one or more vibration measurements and one or more performance parameter measurements acquired from said system;
 - predicting a normal signature from a model defining one or more inter-dependencies between ~~said~~ condition indicators used to construct the condition signature for a previous time, said normal signature corresponding to a condition signature for a healthy system at the present time;
 - comparing said condition signature for the present time with said normal signature; and
 - registering an event if said condition signature for the present time differs from said normal signature by more than a predetermined threshold.
2. (Original) A method according to claim 1, wherein said model is a learnt model.
3. (Original) A method according to claim 1, wherein said model comprises a matrix with one or more non-zero off-diagonal terms to define said interdependencies.
4. (Original) A method according to claim 3, wherein the step of comparing said condition signature with said normal signature involves calculating a value for the normalised innovations squared.
5. (Original) A method according to claim 1, wherein said model comprises a neural network.

6. (Original) A method according to claim 5, wherein the step of comparing said condition signature with said normal signature involves calculating a prediction error.

7. (Original) A method according to claim 1, wherein said times define successive intervals of at most 1 sec duration.

8. (Currently Amended) A method for monitoring the health of a system, which comprises performing at each of a plurality of times defining successive intervals of at most 1 sec duration the steps of:

constructing a condition signature for a present time from a plurality of condition indicators including (a) a plurality of vibration measurements acquired from the system or (b) one or more vibration measurements and one or more performance parameter measurements acquired from said system;

predicting, from condition indicators used to construct the condition signature for a previous time, a normal signature corresponding to a condition signature for a healthy system at the present time;

comparing said condition signature for the present time with said normal signature; and

registering an event if said condition signature for the present time differs from said normal signature by more than a predetermined threshold.

9. (Currently Amended) A method according to claim 8, wherein said normal signature is predicted from a model defining one or more inter-dependencies between said condition indicators used to construct the condition signature for the previous time.

10. (Original) A method according to claim 9, wherein said model is a learnt model.

11. (Original) A method according to claim 9, wherein said model comprises a matrix with one or more non-zero off-diagonal terms to define said interdependencies.

12. (Original) A method according to claim 11, wherein the step of comparing said condition signature with said normal signature involves calculating a value for the normalised innovations squared.

13. (Original) A method according to claim 9, wherein said model comprises a neural network.

14. (Original) A method according to claim 13, wherein the step of comparing said condition signature with said normal signature involves calculating a prediction error.

15. (Currently Amended) A method according to claim 1, wherein said measurements are synchronously acquired from said system to a ~~synchronisation~~ synchronization imprecision of at most 1 sec.

16. (Previously Presented) A method according to claim 1, wherein said system comprises a gas turbine engine.

17. (Currently Amended) A data processing system for monitoring the health of a system, comprising:

data acquisition means for acquiring a plurality of condition indicators from said system at each of a plurality of times, said condition indicators including (a) a plurality of vibration measurements or (b) one or more vibration measurements and one or more performance parameter measurements;

processor means for constructing a condition signature for a present time from said condition indicators and for predicting a normal signature corresponding to a condition signature for a healthy system at the present time, said normal signature being predicted by a model which defines one or more inter-dependencies between ~~said~~ condition indicators used to construct the condition signature for a previous time;

comparator means for comparing said condition signature for the present time with said normal signature; and

registration means for registering an event if said comparator for the present time indicates that said condition signature differs from said normal signature by more than a predetermined threshold.

18. (Currently Amended) A data processing system for monitoring the health of a system, comprising:

data acquisition means for acquiring a plurality of condition indicators from said system at each of a plurality of times defining successive intervals of at most 1 sec duration, said condition indicators including (a) a plurality of vibration measurements or (b) one or more vibration measurements and one or more performance parameter measurements;

processor means for constructing a condition signature for a present time from said condition indicators and for predicting, from condition indicators used to construct the condition signature for a previous time, a normal signature corresponding to a condition signature for a healthy system at the present time;

comparator means for comparing said condition signature for the present time with said normal signature; and

registration means for registering an event if said comparator for the present time indicates that said condition signature differs from said normal signature by more than a predetermined threshold.

19-21. (Cancelled)